SEQUENCE LISTING

<110> Soto, Ana M.
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        Szelei, Jozsef

<120> A NOVEL ANDROGEN-INDUCED SUPPRESSOR OF CELL
        PROLIFERATION AND USES THEREOF

<130> 24815-526

<140> US 09/512,581
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Pro Pro Gly Val Lys Glu Ile Ser Asp Lys Ile Ser Lys Glu Glu Met
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gtg aga cga tta aag atg gtt gtg aaa act ttt atg gat atg gac cag   206
Val Arg Arg Leu Lys Met Val Val Lys Thr Phe Met Asp Met Asp Gln
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gac tct gaa gaa gaa aag gag ctt tat tta aac cta gct tta cat ctt   254
Asp Ser Glu Glu Glu Lys Glu Leu Tyr Leu Asn Leu Ala Leu His Leu
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Val Ala Cys Cys Leu Ala Asp Ile Phe Arg Ile Tyr Ala Pro Glu Ala
80   85   90   95

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Arg Gln Leu Lys Gly Leu Glu Asp Thr Lys Ser Pro Gln Phe Asn Arg
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Tyr Phe Tyr Leu Leu Glu Asn Ile Ala Trp Val Lys Ser Tyr Asn Ile
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tgc ttt gag tta gaa gat agc aat gaa att ttc acc cag cta tac aga      542
Cys Phe Glu Leu Glu Asp Ser Asn Glu Ile Phe Thr Gln Leu Tyr Arg
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acc tta ttt tca gtt ata aac aat ggc cac aat cag aaa gtc cat atg      590
Thr Leu Phe Ser Val Ile Asn Asn Gly His Asn Gln Lys Val His Met
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cac atg gta gac ctt atg agc tct att att tgt gaa ggt gat aca gtg      638
His Met Val Asp Leu Met Ser Ser Ile Ile Cys Glu Gly Asp Thr Val
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tct cag gag ctt ttg gat acg gtt tta gta aat ctg gta cct gct cat      686
Ser Gln Glu Leu Leu Asp Thr Val Leu Val Asn Leu Val Pro Ala His
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aag aat tta aac aag caa gca tat gat ttg gca aag gct tta ctg aag      734
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            210             215             220

agg aca gct caa gct att gag cca tat att acc act ttt ttt aat cag      782
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gtt ctg atg ctt ggg aaa aca tct atc agc gat ttg tca gag cat gtc      830
Val Leu Met Leu Gly Lys Thr Ser Ile Ser Asp Leu Ser Glu His Val
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ttt gac tta att ttg gag ctc tac aat att gat agt cat ttg ctg ctc      878
Phe Asp Leu Ile Leu Glu Leu Tyr Asn Ile Asp Ser His Leu Leu Leu
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tct gtt tta ccc cag ctt gaa ttt aaa tta aag agc aat gat aat gag      926
Ser Val Leu Pro Gln Leu Glu Phe Lys Leu Lys Ser Asn Asp Asn Glu
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gag cgc cta caa gtt gtt aaa cta ctg gca aaa atg ttt ggg gca aag      974
Glu Arg Leu Gln Val Val Lys Leu Leu Ala Lys Met Phe Gly Ala Lys
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gat tca gaa ttg gct tct caa aac aag cca ctt tgg cag tgc tac ttg      1022
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2

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ggc agg ttt aat gat atc cat gta cca atc cgc ctg gaa tgt gtg aaa    1070
Gly Arg Phe Asn Asp Ile His Val Pro Ile Arg Leu Glu Cys Val Lys
320             325             330             335

ttt gct agc cat tgt ctc atg aac cat cct gat tta gca aaa gac tta    1118
Phe Ala Ser His Cys Leu Met Asn His Pro Asp Leu Ala Lys Asp Leu
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aca gag tat ctt aaa gtg agg tca cat gac cct gag gaa gct att aga    1166
Thr Glu Tyr Leu Lys Val Arg Ser His Asp Pro Glu Glu Ala Ile Arg
            355             360             365

cat gat gtt att gtg tca ata gtt aca gct gct aaa aag gat att ctt    1214
His Asp Val Ile Val Ser Ile Val Thr Ala Ala Lys Lys Asp Ile Leu
            370             375             380

ctg gtc aat gat cac tta ctt aat ttt gtg aga gag aga aca tta gac    1262
Leu Val Asn Asp His Leu Leu Asn Phe Val Arg Glu Arg Thr Leu Asp
            385             390             395

aaa cga tgg aga gta cgc aaa gaa gcc atg atg gga ctt gcc caa att    1310
Lys Arg Trp Arg Val Arg Lys Glu Ala Met Met Gly Leu Ala Gln Ile
400             405             410             415

tat aag aaa tat gct tta cag tca gca gct gga aaa gat gct gca aaa    1358
Tyr Lys Lys Tyr Ala Leu Gln Ser Ala Ala Gly Lys Asp Ala Ala Lys
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cag ata gca tgg atc aaa gac aaa ttg cta cat ata tat tat caa aat    1406
Gln Ile Ala Trp Ile Lys Asp Lys Leu Leu His Ile Tyr Tyr Gln Asn
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agt att gat gat cga cta ctt gtt gaa cgg atc ttt gct caa tac atg    1454
Ser Ile Asp Asp Arg Leu Leu Val Glu Arg Ile Phe Ala Gln Tyr Met
            450             455             460

gtt cct cac aat tta gaa act aca gaa cgg atg aaa tgc tta tat tac    1502
Val Pro His Asn Leu Glu Thr Thr Glu Arg Met Lys Cys Leu Tyr Tyr
            465             470             475

ttg tat gcc aca ctg gat tta aat gct gtg aaa gca ttg aat gaa atg    1550
Leu Tyr Ala Thr Leu Asp Leu Asn Ala Val Lys Ala Leu Asn Glu Met
480             485             490             495

tgg aaa tgt caa aat ctg ctc cga cat caa gta aag gat ttg ctt gac    1598
Trp Lys Cys Gln Asn Leu Leu Arg His Gln Val Lys Asp Leu Leu Asp
            500             505             510

ttg att aag caa ccc aaa aca gat gcc agt gtc aag gcc ata ttt tca    1646
Leu Ile Lys Gln Pro Lys Thr Asp Ala Ser Val Lys Ala Ile Phe Ser
            515             520             525

aaa gtg atg gtt att aca aga aat tta cct gat cct ggt aag gct cag    1694
Lys Val Met Val Ile Thr Arg Asn Leu Pro Asp Pro Gly Lys Ala Gln
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gat ttc atg aag aaa ttc aca cag gtg tta gaa gat gat gag aaa ata    1742
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3

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Arg Lys Gln Leu Glu Val Leu Val Ser Pro Thr Cys Ser Cys Lys Gln
560                 565                 570                 575

gct gaa ggt tgt gtg cgt gaa ata act aag aag ttg ggc aac ccc aaa    1838
Ala Glu Gly Cys Val Arg Glu Ile Thr Lys Lys Leu Gly Asn Pro Lys
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cag cct aca aat cct ttc ctg gaa atg atc aag ttt ctc ttg gag agg    1886
Gln Pro Thr Asn Pro Phe Leu Glu Met Ile Lys Phe Leu Leu Glu Arg
                595                 600                 605

ata gca cct gtg cac ata gat acc gaa tct atc agt gct ctt att aaa    1934
Ile Ala Pro Val His Ile Asp Thr Glu Ser Ile Ser Ala Leu Ile Lys
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caa gtg aac aaa tca ata gat gga aca gca gat gat gaa gat gag ggt    1982
Gln Val Asn Lys Ser Ile Asp Gly Thr Ala Asp Asp Glu Asp Glu Gly
        625                 630                 635

gtt cca act gat caa gcc atc aga gca ggt ctt gaa ctg ctt aag gta    2030
Val Pro Thr Asp Gln Ala Ile Arg Ala Gly Leu Glu Leu Leu Lys Val
640                 645                 650                 655

ctc tca ttt aca cat ccc atc tca ttt cat tct gct gaa aca ttt gaa    2078
Leu Ser Phe Thr His Pro Ile Ser Phe His Ser Ala Glu Thr Phe Glu
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tca tta ctg gct tgt ctg aaa atg gat gat gaa aaa gta gca gaa gct    2126
Ser Leu Leu Ala Cys Leu Lys Met Asp Asp Glu Lys Val Ala Glu Ala
            675                 680                 685

gca cta caa att ttc aaa aac aca gga agc aaa att gaa gag gat ttt    2174
Ala Leu Gln Ile Phe Lys Asn Thr Gly Ser Lys Ile Glu Glu Asp Phe
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cca cac atc aga tca gcc ttg ctt cct gtt tta cat cac aaa tct aaa    2222
Pro His Ile Arg Ser Ala Leu Leu Pro Val Leu His His Lys Ser Lys
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aaa gga ccc ccc cgt caa gcc aaa tat gcc att cat tgt atc cat gcg    2270
Lys Gly Pro Pro Arg Gln Ala Lys Tyr Ala Ile His Cys Ile His Ala
720                 725                 730                 735

ata ttt tct agt aaa gag acc cag ttt gca cag ata ttt gag cct ctg    2318
Ile Phe Ser Ser Lys Glu Thr Gln Phe Ala Gln Ile Phe Glu Pro Leu
                740                 745                 750

cat aag agc cta gat cca agc aac ctg gaa cat ctc ata aca cca ttg    2366
His Lys Ser Leu Asp Pro Ser Asn Leu Glu His Leu Ile Thr Pro Leu
                755                 760                 765

gtt act att ggt cat att gct ctc ctt gca cct gat caa ttt gct gct    2414
Val Thr Ile Gly His Ile Ala Leu Leu Ala Pro Asp Gln Phe Ala Ala
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4

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Pro Trp Lys Ser Trp Val Ala Thr Phe Ile Val Lys Asp Leu Leu Met
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aat gat cgg ctt cca ggg aaa aag aca act aaa ctt tgg gtt cca gat    2510
Asn Asp Arg Leu Pro Gly Lys Lys Thr Thr Lys Leu Trp Val Pro Asp
800                 805                 810                 815

gaa gaa gta tct cct gag aca atg gtc aaa att cag gct att aaa atg    2558
Glu Glu Val Ser Pro Glu Thr Met Val Lys Ile Gln Ala Ile Lys Met
                820                 825                 830

atg gtt cga tgg cta ctt gga atg aaa aat aat cac agt aaa tca gga    2606
Met Val Arg Trp Leu Leu Gly Met Lys Asn Asn His Ser Lys Ser Gly
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act tct acc tta aga ttg cta aca aca ata ttg cat agt gat gga gac    2654
Thr Ser Thr Leu Arg Leu Leu Thr Thr Ile Leu His Ser Asp Gly Asp
        850                 855                 860

ttg aca gaa cag ggg aaa att agt aaa cca gat atg tca cgt ctg aga    2702
Leu Thr Glu Gln Gly Lys Ile Ser Lys Pro Asp Met Ser Arg Leu Arg
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ctt gct gct ggg agt gct att gtg aag ctg gca caa gaa ccc tgt tac    2750
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880                 885                 890                 895

cat gaa atc atc aca tta gaa caa tat cag cta tgt gca tta gct atc    2798
His Glu Ile Ile Thr Leu Glu Gln Tyr Gln Leu Cys Ala Leu Ala Ile
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aac gat gaa tgc tat caa gta aga caa gtg ttt gcc cag aaa ctt cac    2846
Asn Asp Glu Cys Tyr Gln Val Arg Gln Val Phe Ala Gln Lys Leu His
                915                 920                 925

aaa ggc ctt tcc cgt tta cgg ctt cca ctt gag tat atg gca atc tgt    2894
Lys Gly Leu Ser Arg Leu Arg Leu Pro Leu Glu Tyr Met Ala Ile Cys
        930                 935                 940

gcc ctt tgt gca aaa gat cct gta aag gag aga aga gct cat gct agg    2942
Ala Leu Cys Ala Lys Asp Pro Val Lys Glu Arg Arg Ala His Ala Arg
        945                 950                 955

caa tgt ttg gtg aaa aat ata aat gta agg cgg gag tat ctg aag cag    2990
Gln Cys Leu Val Lys Asn Ile Asn Val Arg Arg Glu Tyr Leu Lys Gln
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cat gca gct gtt agt gaa aaa tta ttg tct ctt cta cca gag tat gtt    3038
His Ala Ala Val Ser Glu Lys Leu Leu Ser Leu Leu Pro Glu Tyr Val
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gtt cca tat aca att cac ctt ttg gca cat gac cca gat tat gtc aaa    3086
Val Pro Tyr Thr Ile His Leu Leu Ala His Asp Pro Asp Tyr Val Lys
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5

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gtt ctg gaa ata tta atg gct aaa aat gaa aat aac agt cac gct ttt     3182
Val Leu Glu Ile Leu Met Ala Lys Asn Glu Asn Asn Ser His Ala Phe
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atc aga aag atg gta gaa aat att aaa caa aca aaa gat gcc caa gga     3230
Ile Arg Lys Met Val Glu Asn Ile Lys Gln Thr Lys Asp Ala Gln Gly
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cca gat gat gca aaa atg aat gaa aaa ctg tac act gtg tgt gat gtt     3278
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gcc atg aat atc atc atg tca aag agt act aca tac agt ttg gaa tct     3326
Ala Met Asn Ile Ile Met Ser Lys Ser Thr Thr Tyr Ser Leu Glu Ser
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cct aaa gac ccg gta cta cca gct cgt ttc ttc act caa cct gac aag     3374
Pro Lys Asp Pro Val Leu Pro Ala Arg Phe Phe Thr Gln Pro Asp Lys
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aat ttc agt aac acc aaa aat tat ctg cct cct gaa atg aaa tca ttt     3422
Asn Phe Ser Asn Thr Lys Asn Tyr Leu Pro Pro Glu Met Lys Ser Phe
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ttc act cct gga aaa cct aaa aca acc aat gtt cta gga gct gtt aac     3470
Phe Thr Pro Gly Lys Pro Lys Thr Thr Asn Val Leu Gly Ala Val Asn
1120                1125                1130                1135

aag cca ctt tca tca gca ggc aag caa tct cag acc aaa tca tca cga     3518
Lys Pro Leu Ser Ser Ala Gly Lys Gln Ser Gln Thr Lys Ser Ser Arg
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atg gaa act gta agc aat gca agc agc agc tca aat cca agc tct cct     3566
Met Glu Thr Val Ser Asn Ala Ser Ser Ser Ser Asn Pro Ser Ser Pro
        1155                1160                1165

gga aga ata aag ggg agg ctt gat agt tct gaa atg gat cac agt gaa     3614
Gly Arg Ile Lys Gly Arg Leu Asp Ser Ser Glu Met Asp His Ser Glu
        1170                1175                1180

aat gaa gat tac aca atg tct tca cct ttg ccg ggg aaa aaa agt gac     3662
Asn Glu Asp Tyr Thr Met Ser Ser Pro Leu Pro Gly Lys Lys Ser Asp
        1185                1190                1195

aag aga gac gac tct gat ctt gta agg tct gaa ttg gag aag cct aga     3710
Lys Arg Asp Asp Ser Asp Leu Val Arg Ser Glu Leu Glu Lys Pro Arg
1200                1205                1210                1215

ggc agg aaa aaa acg ccc gtc aca gaa cag gag gag aaa tta ggt atg     3758
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cga agt cgg aaa aga ggc cat acg gct tca gaa tct gat gaa cag cag    3854
Arg Ser Arg Lys Arg Gly His Thr Ala Ser Glu Ser Asp Glu Gln Gln
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tgg cct gag gaa aag agg ctc aaa gaa gat ata tta gaa aat gaa gat    3902
Trp Pro Glu Glu Lys Arg Leu Lys Glu Asp Ile Leu Glu Asn Glu Asp
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gaa cag aat agt ccg cca aaa aag ggt aaa aga ggc cga cca cca aaa    3950
Glu Gln Asn Ser Pro Pro Lys Lys Gly Lys Arg Gly Arg Pro Pro Lys
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cct ctt ggt gga ggt aca cca aaa gaa gag cca aca atg aaa act tct    3998
Pro Leu Gly Gly Gly Thr Pro Lys Glu Glu Pro Thr Met Lys Thr Ser
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aaa aaa gga agc aaa aaa aaa tct gga cct cca gca cca gag gag gag    4046
Lys Lys Gly Ser Lys Lys Lys Ser Gly Pro Pro Ala Pro Glu Glu Glu
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gaa gaa gaa gaa aga caa agt gga aat acg gaa cag aag tcc aaa agc    4094
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aaa cag cac cga gtg tca agg aga gca cag cag aga gca gaa tct cct    4142
Lys Gln His Arg Val Ser Arg Arg Ala Gln Gln Arg Ala Glu Ser Pro
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gaa tct agt gca att gaa tcc aca cag tcc aca cca cag aaa gga cga    4190
Glu Ser Ser Ala Ile Glu Ser Thr Gln Ser Thr Pro Gln Lys Gly Arg
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gga aga cca tca aaa acg cca tca cca tca caa cca aaa aaa aat gtg    4238
Gly Arg Pro Ser Lys Thr Pro Ser Pro Ser Gln Pro Lys Lys Asn Val
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7

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Ser Glu Glu Glu Lys Glu Leu Tyr Leu Asn Leu Ala Leu His Leu Ala
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Ser Asp Phe Phe Leu Lys His Pro Gly Lys Asp Val Arg Leu Leu Val
65   70   75   80

Ala Cys Cys Leu Ala Asp Ile Phe Arg Ile Tyr Ala Pro Glu Ala Pro
                85   90   95

Tyr Thr Ser Pro Asp Lys Leu Lys Asp Ile Phe Met Phe Ile Thr Arg
            100   105   110

Gln Leu Lys Gly Leu Glu Asp Thr Lys Ser Pro Gln Phe Asn Arg Tyr
        115   120   125

Phe Tyr Leu Leu Glu Asn Ile Ala Trp Val Lys Ser Tyr Asn Ile Cys
        130   135   140

Phe Glu Leu Glu Asp Ser Asn Glu Ile Phe Thr Gln Leu Tyr Arg Thr
145   150   155   160

8

Leu Phe Ser Val Ile Asn Asn Gly His Asn Gln Lys Val His Met His
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Met Val Asp Leu Met Ser Ser Ile Ile Cys Glu Gly Asp Thr Val Ser
            180   185   190

Gln Glu Leu Leu Asp Thr Val Leu Val Asn Leu Val Pro Ala His Lys
            195   200   205

Asn Leu Asn Lys Gln Ala Tyr Asp Leu Ala Lys Ala Leu Leu Lys Arg
    210   215   220

Thr Ala Gln Ala Ile Glu Pro Tyr Ile Thr Thr Phe Phe Asn Gln Val
225   230   235   240

Leu Met Leu Gly Lys Thr Ser Ile Ser Asp Leu Ser Glu His Val Phe
                245   250   255

Asp Leu Ile Leu Glu Leu Tyr Asn Ile Asp Ser His Leu Leu Leu Ser
            260   265   270

Val Leu Pro Gln Leu Glu Phe Lys Leu Lys Ser Asn Asp Asn Glu Glu
            275   280   285

Arg Leu Gln Val Val Lys Leu Leu Ala Lys Met Phe Gly Ala Lys Asp
    290   295   300

Ser Glu Leu Ala Ser Gln Asn Lys Pro Leu Trp Gln Cys Tyr Leu Gly
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Arg Phe Asn Asp Ile His Val Pro Ile Arg Leu Glu Cys Val Lys Phe
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Ala Ser His Cys Leu Met Asn His Pro Asp Leu Ala Lys Asp Leu Thr
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Glu Tyr Leu Lys Val Arg Ser His Asp Pro Glu Glu Ala Ile Arg His
            355   360   365

Asp Val Ile Val Ser Ile Val Thr Ala Ala Lys Lys Asp Ile Leu Leu
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Val Asn Asp His Leu Leu Asn Phe Val Arg Glu Arg Thr Leu Asp Lys
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Arg Trp Arg Val Arg Lys Glu Ala Met Met Gly Leu Ala Gln Ile Tyr
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Lys Lys Tyr Ala Leu Gln Ser Ala Ala Gly Lys Asp Ala Ala Lys Gln
            420   425   430

Ile Ala Trp Ile Lys Asp Lys Leu Leu His Ile Tyr Tyr Gln Asn Ser
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Ile Asp Asp Arg Leu Leu Val Glu Arg Ile Phe Ala Gln Tyr Met Val
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9

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Pro His Asn Leu Glu Thr Thr Glu Arg Met Lys Cys Leu Tyr Tyr Leu
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Tyr Ala Thr Leu Asp Leu Asn Ala Val Lys Ala Leu Asn Glu Met Trp
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Lys Cys Gln Asn Leu Leu Arg His Gln Val Lys Asp Leu Leu Asp Leu
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Ile Lys Gln Pro Lys Thr Asp Ala Ser Val Lys Ala Ile Phe Ser Lys
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Val Met Val Ile Thr Arg Asn Leu Pro Asp Pro Gly Lys Ala Gln Asp
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Phe Met Lys Lys Phe Thr Gln Val Leu Glu Asp Asp Glu Lys Ile Arg
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Lys Gln Leu Glu Val Leu Val Ser Pro Thr Cys Ser Cys Lys Gln Ala
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Glu Gly Cys Val Arg Glu Ile Thr Lys Lys Leu Gly Asn Pro Lys Gln
            580             585             590

Pro Thr Asn Pro Phe Leu Glu Met Ile Lys Phe Leu Leu Glu Arg Ile
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Ala Pro Val His Ile Asp Thr Glu Ser Ile Ser Ala Leu Ile Lys Gln
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Val Asn Lys Ser Ile Asp Gly Thr Ala Asp Asp Glu Asp Glu Gly Val
625             630             635             640

Pro Thr Asp Gln Ala Ile Arg Ala Gly Leu Glu Leu Leu Lys Val Leu
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Ser Phe Thr His Pro Ile Ser Phe His Ser Ala Glu Thr Phe Glu Ser
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Leu Leu Ala Cys Leu Lys Met Asp Asp Glu Lys Val Ala Glu Ala Ala
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Leu Gln Ile Phe Lys Asn Thr Gly Ser Lys Ile Glu Glu Asp Phe Pro
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His Ile Arg Ser Ala Leu Leu Pro Val Leu His His Lys Ser Lys Lys
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Gly Pro Pro Arg Gln Ala Lys Tyr Ala Ile His Cys Ile His Ala Ile
            725             730             735

Phe Ser Ser Lys Glu Thr Gln Phe Ala Gln Ile Phe Glu Pro Leu His
        740             745             750

Lys Ser Leu Asp Pro Ser Asn Leu Glu His Leu Ile Thr Pro Leu Val
        755             760             765
```

10

Thr Ile Gly His Ile Ala Leu Leu Ala Pro Asp Gln Phe Ala Ala Pro
    770   775   780

Trp Lys Ser Trp Val Ala Thr Phe Ile Val Lys Asp Leu Leu Met Asn
785   790   795   800

Asp Arg Leu Pro Gly Lys Lys Thr Thr Lys Leu Trp Val Pro Asp Glu
            805   810   815

Glu Val Ser Pro Glu Thr Met Val Lys Ile Gln Ala Ile Lys Met Met
            820   825   830

Val Arg Trp Leu Leu Gly Met Lys Asn Asn His Ser Lys Ser Gly Thr
        835   840   845

Ser Thr Leu Arg Leu Leu Thr Thr Ile Leu His Ser Asp Gly Asp Leu
    850   855   860

Thr Glu Gln Gly Lys Ile Ser Lys Pro Asp Met Ser Arg Leu Arg Leu
865   870   875   880

Ala Ala Gly Ser Ala Ile Val Lys Leu Ala Gln Glu Pro Cys Tyr His
            885   890   895

Glu Ile Ile Thr Leu Glu Gln Tyr Gln Leu Cys Ala Leu Ala Ile Asn
            900   905   910

Asp Glu Cys Tyr Gln Val Arg Gln Val Phe Ala Gln Lys Leu His Lys
        915   920   925

Gly Leu Ser Arg Leu Arg Leu Pro Leu Glu Tyr Met Ala Ile Cys Ala
    930   935   940

Leu Cys Ala Lys Asp Pro Val Lys Glu Arg Arg Ala His Ala Arg Gln
945   950   955   960

Cys Leu Val Lys Asn Ile Asn Val Arg Arg Glu Tyr Leu Lys Gln His
            965   970   975

Ala Ala Val Ser Glu Lys Leu Leu Ser Leu Leu Pro Glu Tyr Val Val
            980   985   990

Pro Tyr Thr Ile His Leu Leu Ala His Asp Pro Asp Tyr Val Lys Val
        995   1000   1005

Gln Asp Ile Glu Gln Leu Lys Asp Val Lys Glu Cys Leu Trp Phe Val
    1010   1015   1020

Leu Glu Ile Leu Met Ala Lys Asn Glu Asn Asn Ser His Ala Phe Ile
1025   1030   1035   1040

Arg Lys Met Val Glu Asn Ile Lys Gln Thr Lys Asp Ala Gln Gly Pro
            1045   1050   1055

Asp Asp Ala Lys Met Asn Glu Lys Leu Tyr Thr Val Cys Asp Val Ala
        1060   1065   1070

11

```
Met Asn Ile Ile Met Ser Lys Ser Thr Thr Tyr Ser Leu Glu Ser Pro
    1075              1080              1085

Lys Asp Pro Val Leu Pro Ala Arg Phe Phe Thr Gln Pro Asp Lys Asn
    1090              1095              1100

Phe  Ser Asn Thr Lys Asn Tyr Leu Pro Pro Glu Met Lys Ser Phe Phe
1105              1110              1115              1120

Thr Pro Gly Lys Pro Lys Thr Thr Asn Val Leu Gly Ala Val Asn Lys
              1125              1130              1135

Pro Leu Ser Ser Ala Gly Lys Gln Ser Gln Thr Lys Ser Ser Arg Met
              1140              1145              1150

Glu Thr Val Ser Asn Ala Ser Ser Ser Ser Asn Pro Ser Ser Pro Gly
         1155              1160              1165

Arg Ile Lys Gly Arg Leu Asp Ser Ser Glu Met Asp His Ser Glu Asn
    1170              1175              1180

Glu  Asp Tyr Thr Met Ser Ser Pro Leu Pro Gly Lys Lys Ser Asp Lys
1185              1190              1195              1200

Arg Asp Asp Ser Asp Leu Val Arg Ser Glu Leu Glu Lys Pro Arg Gly
              1205              1210              1215

Arg Lys Lys Thr Pro Val Thr Glu Gln Glu Glu Lys Leu Gly Met Asp
              1220              1225              1230

Asp Leu Thr Lys Leu Val Gln Glu Gln Lys Pro Lys Gly Ser Gln Arg
         1235              1240              1245

Ser Arg Lys Arg Gly His Thr Ala Ser Glu Ser Asp Glu Gln Gln Trp
    1250              1255              1260

Pro  Glu Glu Lys Arg Leu Lys Glu Asp Ile Leu Glu Asn Glu Asp Glu
1265              1270              1275              1280

Gln Asn Ser Pro Pro Lys Lys Gly Lys Arg Gly Arg Pro Pro Lys Pro
              1285              1290              1295

Leu Gly Gly Gly Thr Pro Lys Glu Glu Pro Thr Met Lys Thr Ser Lys
              1300              1305              1310

Lys Gly Ser Lys Lys Lys Ser Gly Pro Pro Ala Pro Glu Glu Glu Glu
    1315              1320              1325

Glu Glu Glu Arg Gln Ser Gly Asn Thr Glu Gln Lys Ser Lys Ser Lys
    1330              1335              1340

Gln  His Arg Val Ser Arg Arg Ala Gln Gln Arg Ala Glu Ser Pro Glu
1345              1350              1355              1360

Ser Ser Ala Ile Glu Ser Thr Gln Ser Thr Pro Gln Lys Gly Arg Gly
              1365              1370              1375
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12

Arg Pro Ser Lys Thr Pro Ser Pro Ser Gln Pro Lys Lys Asn Val
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Met Ala His Ser Lys Thr Arg Thr Asn Asp Gly Lys Ile Thr Tyr Pro
 1   5   10   15

cct ggg gtc aag gaa ata tca gat aaa ata tct aaa gag gag atg gtg   96
Pro Gly Val Lys Glu Ile Ser Asp Lys Ile Ser Lys Glu Glu Met Val
             20   25   30

aga cga tta aag atg gtt gtg aaa act ttt atg gat atg gac cag gac   144
Arg Arg Leu Lys Met Val Val Lys Thr Phe Met Asp Met Asp Gln Asp
         35   40   45

tct gaa gaa gaa aag gag ctt tat tta aac cta gct tta cat ctt gct   192
Ser Glu Glu Glu Lys Glu Leu Tyr Leu Asn Leu Ala Leu His Leu Ala
     50   55   60

tca gat ttt ttt ctc aag cat cct ggt aaa gat gtt cgc tta ctg gta   240
Ser Asp Phe Phe Leu Lys His Pro Gly Lys Asp Val Arg Leu Leu Val
 65   70   75   80

gcc tgc tgc ctt gct gat att ttc agg att tat gct cct gaa gct cct   288
Ala Cys Cys Leu Ala Asp Ile Phe Arg Ile Tyr Ala Pro Glu Ala Pro
             85   90   95

tac aca tcc cct gat aaa cta aag gat ata ttt atg ttt ata aca aga   336
Tyr Thr Ser Pro Asp Lys Leu Lys Asp Ile Phe Met Phe Ile Thr Arg
             100   105   110

cag ttg aag ggg cta gag gat aca aag agc cca caa ttc aat agg tat   384
Gln Leu Lys Gly Leu Glu Asp Thr Lys Ser Pro Gln Phe Asn Arg Tyr
         115   120   125

ttt tat tta ctt gag aac att gct tgg gtc aag tca tat aac ata tgc   432
Phe Tyr Leu Leu Glu Asn Ile Ala Trp Val Lys Ser Tyr Asn Ile Cys
     130   135   140

ttt gag tta gaa gat agc aat gaa att ttc acc cag cta tac aga acc   480
Phe Glu Leu Glu Asp Ser Asn Glu Ile Phe Thr Gln Leu Tyr Arg Thr
145   150   155   160

tta ttt tca gtt ata aac aat ggc cac aat cag aaa gtc cat atg cac   528
Leu Phe Ser Val Ile Asn Asn Gly His Asn Gln Lys Val His Met His
             165   170   175

13

```
atg gta gac ctt atg agc tct att att tgt gaa ggt gat aca gtg tct    576
Met Val Asp Leu Met Ser Ser Ile Ile Cys Glu Gly Asp Thr Val Ser
            180                 185                 190

cag gag ctt ttg gat acg gtt tta gta aat ctg gta cct gct cat aag    624
Gln Glu Leu Leu Asp Thr Val Leu Val Asn Leu Val Pro Ala His Lys
            195                 200                 205

aat tta aac aag caa gca tat gat ttg gca aag gct tta ctg aag agg    672
Asn Leu Asn Lys Gln Ala Tyr Asp Leu Ala Lys Ala Leu Leu Lys Arg
            210                 215                 220

aca gct caa gct att gag cca tat att acc act ttt ttt aat cag gtt    720
Thr Ala Gln Ala Ile Glu Pro Tyr Ile Thr Thr Phe Phe Asn Gln Val
225                 230                 235                 240

ctg atg ctt ggg aaa aca tct atc agc gat ttg tca gag cat gtc ttt    768
Leu Met Leu Gly Lys Thr Ser Ile Ser Asp Leu Ser Glu His Val Phe
                245                 250                 255

gac tta att ttg gag ctc tac aat att gat agt cat ttg ctg ctc tct    816
Asp Leu Ile Leu Glu Leu Tyr Asn Ile Asp Ser His Leu Leu Leu Ser
            260                 265                 270

gtt tta ccc cag ctt gaa ttt aaa tta aag agc aat gat aat gag gag    864
Val Leu Pro Gln Leu Glu Phe Lys Leu Lys Ser Asn Asp Asn Glu Glu
            275                 280                 285

cgc cta caa gtt gtt aaa cta ctg gca aaa atg ttt ggg gca aag gat    912
Arg Leu Gln Val Val Lys Leu Leu Ala Lys Met Phe Gly Ala Lys Asp
            290                 295                 300

tca gaa ttg gct tct caa aac aag cca ctt tgg cag tgc tac ttg ggc    960
Ser Glu Leu Ala Ser Gln Asn Lys Pro Leu Trp Gln Cys Tyr Leu Gly
305                 310                 315                 320

agg ttt aat gat atc cat gta cca atc cgc ctg gaa tgt gtg aaa ttt   1008
Arg Phe Asn Asp Ile His Val Pro Ile Arg Leu Glu Cys Val Lys Phe
                325                 330                 335

gct agc cat tgt ctc atg aac cat cct gat tta gca aaa gac tta aca   1056
Ala Ser His Cys Leu Met Asn His Pro Asp Leu Ala Lys Asp Leu Thr
                340                 345                 350

gag tat ctt aaa gtg agg tca cat gac cct gag gaa gct att aga cat   1104
Glu Tyr Leu Lys Val Arg Ser His Asp Pro Glu Glu Ala Ile Arg His
            355                 360                 365

gat gtt att gtg tca ata gtt aca gct gct aaa aag gat att ctt ctg   1152
Asp Val Ile Val Ser Ile Val Thr Ala Ala Lys Lys Asp Ile Leu Leu
            370                 375                 380

gtc aat gat cac tta ctt aat ttt gtg aga gag aga aca tta gac aaa   1200
Val Asn Asp His Leu Leu Asn Phe Val Arg Glu Arg Thr Leu Asp Lys
385                 390                 395                 400
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14

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cga tgg aga gta cgc aaa gaa gcc atg atg gga ctt gcc caa att tat    1248
Arg Trp Arg Val Arg Lys Glu Ala Met Met Gly Leu Ala Gln Ile Tyr
            405                 410                 415

aag aaa tat gct tta cag tca gca gct gga aaa gat gct gca aaa cag    1296
Lys Lys Tyr Ala Leu Gln Ser Ala Ala Gly Lys Asp Ala Ala Lys Gln
            420                 425                 430

ata gca tgg atc aaa gac aaa ttg cta cat ata tat tat caa aat agt    1344
Ile Ala Trp Ile Lys Asp Lys Leu Leu His Ile Tyr Tyr Gln Asn Ser
            435                 440                 445

att gat gat cga cta ctt gtt gaa cgg atc ttt gct caa tac atg gtt    1392
Ile Asp Asp Arg Leu Leu Val Glu Arg Ile Phe Ala Gln Tyr Met Val
        450                 455                 460

cct cac aat tta gaa act aca gaa cgg atg aaa tgc tta tat tac ttg    1440
Pro His Asn Leu Glu Thr Thr Glu Arg Met Lys Cys Leu Tyr Tyr Leu
465                 470                 475                 480

tat gcc aca ctg gat tta aat gct gtg aaa gca ttg aat gaa atg tgg    1488
Tyr Ala Thr Leu Asp Leu Asn Ala Val Lys Ala Leu Asn Glu Met Trp
                485                 490                 495

aaa tgt caa aat ctg ctc cga cat caa gta aag gat ttg ctt gac ttg    1536
Lys Cys Gln Asn Leu Leu Arg His Gln Val Lys Asp Leu Leu Asp Leu
            500                 505                 510

att aag caa ccc aaa aca gat gcc agt gtc aag gcc ata ttt tca aaa    1584
Ile Lys Gln Pro Lys Thr Asp Ala Ser Val Lys Ala Ile Phe Ser Lys
            515                 520                 525

gtg atg gtt att aca aga aat tta cct gat cct ggt aag gct cag gat    1632
Val Met Val Ile Thr Arg Asn Leu Pro Asp Pro Gly Lys Ala Gln Asp
        530                 535                 540

ttc atg aag aaa ttc aca cag gtg tta gaa gat gat gag aaa ata aga    1680
Phe Met Lys Lys Phe Thr Gln Val Leu Glu Asp Asp Glu Lys Ile Arg
545                 550                 555                 560

aag cag tta gaa gta ctt gtt agt cca aca tgc tcc tgc aag cag gct    1728
Lys Gln Leu Glu Val Leu Val Ser Pro Thr Cys Ser Cys Lys Gln Ala
                565                 570                 575

gaa ggt tgt gtg cgt gaa ata act aag aag ttg ggc aac ccc aaa cag    1776
Glu Gly Cys Val Arg Glu Ile Thr Lys Lys Leu Gly Asn Pro Lys Gln
            580                 585                 590

cct aca aat cct ttc ctg gaa atg atc aag ttt ctc ttg gag agg ata    1824
Pro Thr Asn Pro Phe Leu Glu Met Ile Lys Phe Leu Leu Glu Arg Ile
            595                 600                 605

gca cct gtg cac ata gat acc gaa tct atc agt gct ctt att aaa caa    1872
Ala Pro Val His Ile Asp Thr Glu Ser Ile Ser Ala Leu Ile Lys Gln
610                 615                 620

gtg aac aaa tca ata gat gga aca gca gat gat gaa gat gag ggt gtt    1920
Val Asn Lys Ser Ile Asp Gly Thr Ala Asp Asp Glu Asp Glu Gly Val
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15

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Val Asn Lys Ser Ile Asp Gly Thr Ala Asp Asp Glu Asp Glu Gly Val
625             630             635             640

cca act gat caa gcc atc aga gca ggt ctt gaa ctg ctt aag gta ctc    1968
Pro Thr Asp Gln Ala Ile Arg Ala Gly Leu Glu Leu Leu Lys Val Leu
                645             650             655

tca ttt aca cat ccc atc tca ttt cat tct gct gaa aca ttt gaa tca    2016
Ser Phe Thr His Pro Ile Ser Phe His Ser Ala Glu Thr Phe Glu Ser
                660             665             670

tta ctg gct tgt ctg aaa atg gat gat gaa aaa gta gca gaa gct gca    2064
Leu Leu Ala Cys Leu Lys Met Asp Asp Glu Lys Val Ala Glu Ala Ala
            675             680             685

cta caa att ttc aaa aac aca gga agc aaa att gaa gag gat ttt cca    2112
Leu Gln Ile Phe Lys Asn Thr Gly Ser Lys Ile Glu Glu Asp Phe Pro
        690             695             700

cac atc aga tca gcc ttg ctt cct gtt tta cat cac aaa tct aaa aaa    2160
His Ile Arg Ser Ala Leu Leu Pro Val Leu His His Lys Ser Lys Lys
705             710             715             720

gga ccc ccc cgt caa gcc aaa tat gcc att cat tgt atc cat gcg ata    2208
Gly Pro Pro Arg Gln Ala Lys Tyr Ala Ile His Cys Ile His Ala Ile
                725             730             735

ttt tct agt aaa gag acc cag ttt gca cag ata ttt gag cct ctg cat    2256
Phe Ser Ser Lys Glu Thr Gln Phe Ala Gln Ile Phe Glu Pro Leu His
                740             745             750

aag agc cta gat cca agc aac ctg gaa cat ctc ata aca cca ttg gtt    2304
Lys Ser Leu Asp Pro Ser Asn Leu Glu His Leu Ile Thr Pro Leu Val
            755             760             765

act att ggt cat att gct ctc ctt gca cct gat caa ttt gct gct cct    2352
Thr Ile Gly His Ile Ala Leu Leu Ala Pro Asp Gln Phe Ala Ala Pro
        770             775             780

tgg aaa tct tgg gta gct act ttc att gtg aaa gat ctt ctc atg aat    2400
Trp Lys Ser Trp Val Ala Thr Phe Ile Val Lys Asp Leu Leu Met Asn
785             790             795             800

gat cgg ctt cca ggg aaa aag aca act aaa ctt tgg gtt cca gat gaa    2448
Asp Arg Leu Pro Gly Lys Lys Thr Thr Lys Leu Trp Val Pro Asp Glu
            805             810             815

gaa gta tct cct gag aca atg gtc aaa att cag gct att aaa atg atg    2496
Glu Val Ser Pro Glu Thr Met Val Lys Ile Gln Ala Ile Lys Met Met
            820             825             830

gtt cga tgg cta ctt gga atg aaa aat aat cac agt aaa tca gga act    2544
Val Arg Trp Leu Leu Gly Met Lys Asn Asn His Ser Lys Ser Gly Thr
        835             840             845

tct acc tta aga ttg cta aca aca ata ttg cat agt gat gga gac ttg    2592
Ser Thr Leu Arg Leu Leu Thr Thr Ile Leu His Ser Asp Gly Asp Leu
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16

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aca gaa cag ggg aaa att agt aaa cca gat atg tca cgt ctg aga ctt    2640
Thr Glu Gln Gly Lys Ile Ser Lys Pro Asp Met Ser Arg Leu Arg Leu
865                 870                 875                 880

gct gct ggg agt gct att gtg aag ctg gca caa gaa ccc tgt tac cat    2688
Ala Ala Gly Ser Ala Ile Val Lys Leu Ala Gln Glu Pro Cys Tyr His
                885                 890                 895

gaa atc atc aca tta gaa caa tat cag cta tgt gca tta gct atc aac    2736
Glu Ile Ile Thr Leu Glu Gln Tyr Gln Leu Cys Ala Leu Ala Ile Asn
                900                 905                 910

gat gaa tgc tat caa gta aga caa gtg ttt gcc cag aaa ctt cac aaa    2784
Asp Glu Cys Tyr Gln Val Arg Gln Val Phe Ala Gln Lys Leu His Lys
                915                 920                 925

ggc ctt tcc cgt tta cgg ctt cca ctt gag tat atg gca atc tgt gcc    2832
Gly Leu Ser Arg Leu Arg Leu Pro Leu Glu Tyr Met Ala Ile Cys Ala
                930                 935                 940

ctt tgt gca aaa gat cct gta aag gag aga aga gct cat gct agg caa    2880
Leu Cys Ala Lys Asp Pro Val Lys Glu Arg Arg Ala His Ala Arg Gln
945                 950                 955                 960

tgt ttg gtg aaa aat ata aat gta agg cgg gag tat ctg aag cag cat    2928
Cys Leu Val Lys Asn Ile Asn Val Arg Arg Glu Tyr Leu Lys Gln His
                965                 970                 975

gca gct gtt agt gaa aaa tta ttg tct ctt cta cca gag tat gtt gtt    2976
Ala Ala Val Ser Glu Lys Leu Leu Ser Leu Leu Pro Glu Tyr Val Val
                980                 985                 990

cca tat aca att cac ctt ttg gca cat gac cca gat tat gtc aaa gta    3024
Pro Tyr Thr Ile His Leu Leu Ala His Asp Pro Asp Tyr Val Lys Val
                995                 1000                1005

cag gat att gaa caa ctt aaa gat gtt aaa gaa tgt ctt tgg ttt gtt    3072
Gln Asp Ile Glu Gln Leu Lys Asp Val Lys Glu Cys Leu Trp Phe Val
    1010                1015                1020

ctg gaa ata tta atg gct aaa aat gaa aat aac agt cac gct ttt atc    3120
Leu Glu Ile Leu Met Ala Lys Asn Glu Asn Asn Ser His Ala Phe Ile
1025                1030                1035                1040

aga aag atg gta gaa aat att aaa caa aca aaa gat gcc caa gga cca    3168
Arg Lys Met Val Glu Asn Ile Lys Gln Thr Lys Asp Ala Gln Gly Pro
                1045                1050                1055

gat gat gca aaa atg aat gaa aaa ctg tac act gtg tgt gat gtt gcc    3216
Asp Asp Ala Lys Met Asn Glu Lys Leu Tyr Thr Val Cys Asp Val Ala
                1060                1065                1070

atg aat atc atc atg tca aag agt act aca tac agt ttg gaa tct cct    3264
Met Asn Ile Ile Met Ser Lys Ser Thr Thr Tyr Ser Leu Glu Ser Pro
                1075                1080                1085
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17

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aaa gac ccg gta cta cca gct cgt ttc ttc act caa cct gac aag aat    3312
Lys Asp Pro Val Leu Pro Ala Arg Phe Phe Thr Gln Pro Asp Lys Asn
    1090                1095                1100

ttc agt aac acc aaa aat tat ctg cct cct gaa atg aaa tca ttt ttc    3360
Phe Ser Asn Thr Lys Asn Tyr Leu Pro Pro Glu Met Lys Ser Phe Phe
1105                1110                1115                1120

act cct gga aaa cct aaa aca acc aat gtt cta gga gct gtt aac aag    3408
Thr Pro Gly Lys Pro Lys Thr Thr Asn Val Leu Gly Ala Val Asn Lys
                1125                1130                1135

cca ctt tca tca gca ggc aag caa tct cag acc aaa tca tca cga atg    3456
Pro Leu Ser Ser Ala Gly Lys Gln Ser Gln Thr Lys Ser Ser Arg Met
            1140                1145                1150

gaa act gta agc aat gca agc agc agc tca aat cca agc tct cct gga    3504
Glu Thr Val Ser Asn Ala Ser Ser Ser Ser Asn Pro Ser Ser Pro Gly
        1155                1160                1165

aga ata aag ggg agg ctt gat agt tct gaa atg gat cac agt gaa aat    3552
Arg Ile Lys Gly Arg Leu Asp Ser Ser Glu Met Asp His Ser Glu Asn
    1170                1175                1180

gaa gat tac aca atg tct tca cct ttg ccg ggg aaa aaa agt gac aag    3600
Glu Asp Tyr Thr Met Ser Ser Pro Leu Pro Gly Lys Lys Ser Asp Lys
1185                1190                1195                1200

aga gac gac tct gat ctt gta agg tct gaa ttg gag aag cct aga ggc    3648
Arg Asp Asp Ser Asp Leu Val Arg Ser Glu Leu Glu Lys Pro Arg Gly
                1205                1210                1215

agg aaa aaa acg ccc gtc aca gaa cag gag gag aaa tta ggt atg gat    3696
Arg Lys Lys Thr Pro Val Thr Glu Gln Glu Glu Lys Leu Gly Met Asp
            1220                1225                1230

gac ttg act aag ttg gta cag gaa cag aaa cct aaa ggc agt cag cga    3744
Asp Leu Thr Lys Leu Val Gln Glu Gln Lys Pro Lys Gly Ser Gln Arg
        1235                1240                1245

agt cgg aaa aga ggc cat acg gct tca gaa tct gat gaa cag cag tgg    3792
Ser Arg Lys Arg Gly His Thr Ala Ser Glu Ser Asp Glu Gln Gln Trp
    1250                1255                1260

cct gag gaa aag agg ctc aaa gaa gat ata tta gaa aat gaa gat gaa    3840
Pro Glu Glu Lys Arg Leu Lys Glu Asp Ile Leu Glu Asn Glu Asp Glu
1265                1270                1275                1280

cag aat agt ccg cca aaa aag ggt aaa aga ggc cga cca cca aaa cct    3888
Gln Asn Ser Pro Pro Lys Lys Gly Lys Arg Gly Arg Pro Pro Lys Pro
                1285                1290                1295

ctt ggt gga ggt aca cca aaa gaa gag cca aca atg aaa act tct aaa    3936
Leu Gly Gly Gly Thr Pro Lys Glu Glu Pro Thr Met Lys Thr Ser Lys
            1300                1305                1310
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18

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aaa gga agc aaa aaa aaa tct gga cct cca gca cca gag gag gag gaa    3984
Lys Gly Ser Lys Lys Lys Ser Gly Pro Pro Ala Pro Glu Glu Glu Glu
        1315                1320                1325

gaa gaa gaa aga caa agt gga aat acg gaa cag aag tcc aaa agc aaa    4032
Glu Glu Glu Arg Gln Ser Gly Asn Thr Glu Gln Lys Ser Lys Ser Lys
        1330                1335                1340

cag cac cga gtg tca agg aga gca cag cag aga gca gaa tct cct gaa    4080
Gln His Arg Val Ser Arg Arg Ala Gln Gln Arg Ala Glu Ser Pro Glu
1345                1350                1355                1360

tct agt gca att gaa tcc aca cag tcc aca cca cag aaa gga cga gga    4128
Ser Ser Ala Ile Glu Ser Thr Gln Ser Thr Pro Gln Lys Gly Arg Gly
                1365                1370                1375

aga cca tca aaa acg cca tca cca tca caa cca aaa aaa aat gtg        4173
Arg Pro Ser Lys Thr Pro Ser Pro Ser Gln Pro Lys Lys Asn Val
                1380                1385                1390


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caacccggag gggtagaaat atttctgtc atg gct cat tca aag act agg acc   173
                                  Met Ala His Ser Lys Thr Arg Thr
                                   1               5

aat gat gga aaa att aca tat ccg cct ggg gtc aag gaa ata tca gat   221
Asn Asp Gly Lys Ile Thr Tyr Pro Pro Gly Val Lys Glu Ile Ser Asp
        10              15                  20

aaa ata tct aaa gag gag atg gtg aga cga tta aag atg gtt gtg aaa   269
Lys Ile Ser Lys Glu Glu Met Val Arg Arg Leu Lys Met Val Val Lys
 25                  30                  35                  40

act ttt atg gat atg gac cag gac tct gaa gaa gaa aag gag ctt tat   317
Thr Phe Met Asp Met Asp Gln Asp Ser Glu Glu Glu Lys Glu Leu Tyr
                45                  50                  55

tta aac cta gct tta cat ctt gct tca gat ttt ttt ctc aag cat cct   365
Leu Asn Leu Ala Leu His Leu Ala Ser Asp Phe Phe Leu Lys His Pro
            60                  65                  70

ggt aaa gat gtt cgc tta ctg gta gcc tgc tgc ctt gct gat att ttc   413
Gly Lys Asp Val Arg Leu Leu Val Ala Cys Cys Leu Ala Asp Ile Phe
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19

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agg att tat gct cct gaa gct cct tac aca tcc cct gat aaa cta aag   461
Arg Ile Tyr Ala Pro Glu Ala Pro Tyr Thr Ser Pro Asp Lys Leu Lys
        90              95              100

gat ata ttt atg ttt ata aca aga cag ttg aag ggg cta gag gat aca   509
Asp Ile Phe Met Phe Ile Thr Arg Gln Leu Lys Gly Leu Glu Asp Thr
105             110             115             120

aag agc cca caa ttc aat agg tat ttt tat tta ctt gag aac att gct   557
Lys Ser Pro Gln Phe Asn Arg Tyr Phe Tyr Leu Leu Glu Asn Ile Ala
                125             130             135

tgg gtc aag tca tat aac ata tgc ttt gag tta gaa gat agc aat gaa   605
Trp Val Lys Ser Tyr Asn Ile Cys Phe Glu Leu Glu Asp Ser Asn Glu
                140             145             150

att ttc acc cag cta tac aga acc tta ttt tca gtt ata aac aat ggc   653
Ile Phe Thr Gln Leu Tyr Arg Thr Leu Phe Ser Val Ile Asn Asn Gly
        155             160             165

cac aat cag aaa gtc cat atg cac atg gta gac ctt atg agc tct att   701
His Asn Gln Lys Val His Met His Met Val Asp Leu Met Ser Ser Ile
    170             175             180

att tgt gaa ggt gat aca gtg tct cag gag ctt ttg gat acg gtt tta   749
Ile Cys Glu Gly Asp Thr Val Ser Gln Glu Leu Leu Asp Thr Val Leu
185             190             195             200

gta aat ctg gta cct gct cat aag aat tta aac aag caa gca tat gat   797
Val Asn Leu Val Pro Ala His Lys Asn Leu Asn Lys Gln Ala Tyr Asp
                205             210             215

ttg gca aag gct tta ctg aag agg aca gct caa gct att gag cca tat   845
Leu Ala Lys Ala Leu Leu Lys Arg Thr Ala Gln Ala Ile Glu Pro Tyr
                220             225             230

att acc act ttt ttt aat cag gtt ctg atg ctt ggg aaa aca tct atc   893
Ile Thr Thr Phe Phe Asn Gln Val Leu Met Leu Gly Lys Thr Ser Ile
        235             240             245

agc gat ttg tca gag cat gtc ttt gac tta att ttg gag ctc tac aat   941
Ser Asp Leu Ser Glu His Val Phe Asp Leu Ile Leu Glu Leu Tyr Asn
    250             255             260

att gat agt cat ttg ctg ctc tct gtt tta ccc cag ctt gaa ttt aaa   989
Ile Asp Ser His Leu Leu Leu Ser Val Leu Pro Gln Leu Glu Phe Lys
265             270             275             280

tta aag agc aat gat aat gag gag cgc cta caa gtt gtt aaa cta ctg   1037
Leu Lys Ser Asn Asp Asn Glu Glu Arg Leu Gln Val Val Lys Leu Leu
                285             290             295

gca aaa atg ttt ggg gca aag gat tca gaa ttg gct tct caa aac aag   1085
Ala Lys Met Phe Gly Ala Lys Asp Ser Glu Leu Ala Ser Gln Asn Lys
        300             305             310
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20

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cca ctt tgg cag tgc tac ttg ggc agg ttt aat gat atc cat gta cca    1133
Pro Leu Trp Gln Cys Tyr Leu Gly Arg Phe Asn Asp Ile His Val Pro
        315             320             325

atc cgc ctg gaa tgt gtg aaa ttt gct agc cat tgt ctc atg aac cat    1181
Ile Arg Leu Glu Cys Val Lys Phe Ala Ser His Cys Leu Met Asn His
        330             335             340

cct gat tta gca aaa gac tta aca gag tat ctt aaa gtg agg tca cat    1229
Pro Asp Leu Ala Lys Asp Leu Thr Glu Tyr Leu Lys Val Arg Ser His
345             350             355             360

gac cct gag gaa gct att aga cat gat gtt att gtg tca ata gtt aca    1277
Asp Pro Glu Glu Ala Ile Arg His Asp Val Ile Val Ser Ile Val Thr
                365             370             375

gct gct aaa aag gat att ctt ctg gtc aat gat cac tta ctt aat ttt    1325
Ala Ala Lys Lys Asp Ile Leu Leu Val Asn Asp His Leu Leu Asn Phe
            380             385             390

gtg aga gag aga aca tta gac aaa cga tgg aga gta cgc aaa gaa gcc    1373
Val Arg Glu Arg Thr Leu Asp Lys Arg Trp Arg Val Arg Lys Glu Ala
        395             400             405

atg atg gga ctt gcc caa att tat aag aaa tat gct tta cag tca gca    1421
Met Met Gly Leu Ala Gln Ile Tyr Lys Lys Tyr Ala Leu Gln Ser Ala
    410             415             420

gct gga aaa gat gct gca aaa cag ata gca tgg atc aaa gac aaa ttg    1469
Ala Gly Lys Asp Ala Ala Lys Gln Ile Ala Trp Ile Lys Asp Lys Leu
425             430             435             440

cta cat ata tat tat caa aat agt att gat gat cga cta ctt gtt gaa    1517
Leu His Ile Tyr Tyr Gln Asn Ser Ile Asp Asp Arg Leu Leu Val Glu
                445             450             455

cgg atc ttt gct caa tac atg gtt cct cac aat tta gaa act aca gaa    1565
Arg Ile Phe Ala Gln Tyr Met Val Pro His Asn Leu Glu Thr Thr Glu
            460             465             470

cgg atg aaa tgc tta tat tac ttg tat gcc aca ctg gat tta aat gct    1613
Arg Met Lys Cys Leu Tyr Tyr Leu Tyr Ala Thr Leu Asp Leu Asn Ala
        475             480             485

gtg aaa gca ttg aat gaa atg tgg aaa tgt caa aat ctg ctc cga cat    1661
Val Lys Ala Leu Asn Glu Met Trp Lys Cys Gln Asn Leu Leu Arg His
        490             495             500

caa gta aag gat ttg ctt gac ttg att aag caa ccc aaa aca gat gcc    1709
Gln Val Lys Asp Leu Leu Asp Leu Ile Lys Gln Pro Lys Thr Asp Ala
505             510             515             520

agt gtc aag gcc ata ttt tca aaa gtg atg gtt att aca aga aat tta    1757
Ser Val Lys Ala Ile Phe Ser Lys Val Met Val Ile Thr Arg Asn Leu
            525             530             535
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21

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cct gat cct ggt aag gct cag gat ttc atg aag aaa ttc aca cag gtg    1805
Pro Asp Pro Gly Lys Ala Gln Asp Phe Met Lys Lys Phe Thr Gln Val
            540                 545                 550

tta gaa gat gat gag aaa ata aga aag cag tta gaa gta ctt gtt agt    1853
Leu Glu Asp Asp Glu Lys Ile Arg Lys Gln Leu Glu Val Leu Val Ser
            555                 560                 565

cca aca tgc tcc tgc aag cag gct gaa ggt tgt gtg cgt gaa ata act    1901
Pro Thr Cys Ser Cys Lys Gln Ala Glu Gly Cys Val Arg Glu Ile Thr
    570                 575                 580

aag aag ttg ggc aac ccc aaa cag cct aca aat cct ttc ctg gaa atg    1949
Lys Lys Leu Gly Asn Pro Lys Gln Pro Thr Asn Pro Phe Leu Glu Met
585                 590                 595                 600

atc aag ttt ctc ttg gag agg ata gca cct gtg cac ata gat acc gaa    1997
Ile Lys Phe Leu Leu Glu Arg Ile Ala Pro Val His Ile Asp Thr Glu
            605                 610                 615

tct atc agt gct ctt att aaa caa gtg aac aaa tca ata gat gga aca    2045
Ser Ile Ser Ala Leu Ile Lys Gln Val Asn Lys Ser Ile Asp Gly Thr
            620                 625                 630

gca gat gat gaa gat gag ggt gtt cca act gat caa gcc atc aga gca    2093
Ala Asp Asp Glu Asp Glu Gly Val Pro Thr Asp Gln Ala Ile Arg Ala
            635                 640                 645

ggt ctt gaa ctg ctt aag gta ctc tca ttt aca cat ccc atc tca ttt    2141
Gly Leu Glu Leu Leu Lys Val Leu Ser Phe Thr His Pro Ile Ser Phe
    650                 655                 660

cat tct gct gaa aca ttt gaa tca tta ctg gct tgt ctg aaa atg gat    2189
His Ser Ala Glu Thr Phe Glu Ser Leu Leu Ala Cys Leu Lys Met Asp
665                 670                 675                 680

gat gaa aaa gta gca gaa gct gca cta caa att ttc aaa aac aca gga    2237
Asp Glu Lys Val Ala Glu Ala Ala Leu Gln Ile Phe Lys Asn Thr Gly
            685                 690                 695

agc aaa att gaa gag gat ttt cca cac atc aga tca gcc ttg ctt cct    2285
Ser Lys Ile Glu Glu Asp Phe Pro His Ile Arg Ser Ala Leu Leu Pro
            700                 705                 710

gtt tta cat cac aaa tct aaa aaa gga ccc ccc cgt caa gcc aaa tat    2333
Val Leu His His Lys Ser Lys Lys Gly Pro Pro Arg Gln Ala Lys Tyr
            715                 720                 725

gcc att cat tgt atc cat gcg ata ttt tct agt aaa gag acc cag ttt    2381
Ala Ile His Cys Ile His Ala Ile Phe Ser Ser Lys Glu Thr Gln Phe
            730                 735                 740

gca cag ata ttt gag cct ctg cat aag agc cta gat cca agc aac ctg    2429
Ala Gln Ile Phe Glu Pro Leu His Lys Ser Leu Asp Pro Ser Asn Leu
745                 750                 755                 760

gaa cat ctc ata aca cca ttg gtt act att ggt cat att gct ctc ctt    2477
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22

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Glu His Leu Ile Thr Pro Leu Val Thr Ile Gly His Ile Ala Leu Leu
                765             770             775

gca cct gat caa ttt gct gct cct tgg aaa tct tgg gta gct act ttc   2525
Ala Pro Asp Gln Phe Ala Ala Pro Trp Lys Ser Trp Val Ala Thr Phe
            780             785             790

att gtg aaa gat ctt ctc atg aat gat cgg ctt cca ggg aaa aag aca   2573
Ile Val Lys Asp Leu Leu Met Asn Asp Arg Leu Pro Gly Lys Lys Thr
            795             800             805

act aaa ctt tgg gtt cca gat gaa gaa gta tct cct gag aca atg gtc   2621
Thr Lys Leu Trp Val Pro Asp Glu Glu Val Ser Pro Glu Thr Met Val
            810             815             820

aaa att cag gct att aaa atg atg gtt cga tgg cta ctt gga atg aaa   2669
Lys Ile Gln Ala Ile Lys Met Met Val Arg Trp Leu Leu Gly Met Lys
825             830             835             840

aat aat cac agt aaa tca gga act tct acc tta aga ttg cta aca aca   2717
Asn Asn His Ser Lys Ser Gly Thr Ser Thr Leu Arg Leu Leu Thr Thr
            845             850             855

ata ttg cat agt gat gga gac ttg aca gaa cag ggg aaa att agt aaa   2765
Ile Leu His Ser Asp Gly Asp Leu Thr Glu Gln Gly Lys Ile Ser Lys
            860             865             870

cca gat atg tca cgt ctg aga ctt gct gct ggg agt gct att gtg aag   2813
Pro Asp Met Ser Arg Leu Arg Leu Ala Ala Gly Ser Ala Ile Val Lys
            875             880             885

ctg gca caa gaa ccc tgt tac cat gaa atc atc aca tta gaa caa tat   2861
Leu Ala Gln Glu Pro Cys Tyr His Glu Ile Ile Thr Leu Glu Gln Tyr
            890             895             900

cag cta tgt gca tta gct atc aac gat gaa tgc tat caa gta aga caa   2909
Gln Leu Cys Ala Leu Ala Ile Asn Asp Glu Cys Tyr Gln Val Arg Gln
905             910             915             920

gtg ttt gcc cag aaa ctt cac aaa ggc ctt tcc cgt tta cgg ctt cca   2957
Val Phe Ala Gln Lys Leu His Lys Gly Leu Ser Arg Leu Arg Leu Pro
            925             930             935

ctt gag tat atg gca atc tgt gcc ctt tgt gca aaa gat cct gta aag   3005
Leu Glu Tyr Met Ala Ile Cys Ala Leu Cys Ala Lys Asp Pro Val Lys
            940             945             950

gag aga aga gct cat gct agg caa tgt ttg gtg aaa aat ata aat gta   3053
Glu Arg Arg Ala His Ala Arg Gln Cys Leu Val Lys Asn Ile Asn Val
            955             960             965

agg cgg gag tat ctg aag cag cat gca gct gtt agt gaa aaa tta ttg   3101
Arg Arg Glu Tyr Leu Lys Gln His Ala Ala Val Ser Glu Lys Leu Leu
            970             975             980

tct ctt cta cca gag tat gtt gtt cca tat aca att cac ctt ttg gca   3149
Ser Leu Leu Pro Glu Tyr Val Val Pro Tyr Thr Ile His Leu Leu Ala
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23

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cat gac cca gat tat gtc aaa gta cag gat att gaa caa ctt aaa gat   3197
His Asp Pro Asp Tyr Val Lys Val Gln Asp Ile Glu Gln Leu Lys Asp
            1005                    1010                    1015

gtt aaa gaa tgt ctt tgg ttt gtt ctg gaa ata tta atg gct aaa aat   3245
Val Lys Glu Cys Leu Trp Phe Val Leu Glu Ile Leu Met Ala Lys Asn
            1020                    1025                    1030

gaa aat aac agt cac gct ttt atc aga aag atg gta gaa aat att aaa   3293
Glu Asn Asn Ser His Ala Phe Ile Arg Lys Met Val Glu Asn Ile Lys
            1035                    1040                    1045

caa aca aaa gat gcc caa gga cca gat gat gca aaa atg aat gaa aaa   3341
Gln Thr Lys Asp Ala Gln Gly Pro Asp Asp Ala Lys Met Asn Glu Lys
        1050                    1055                    1060

ctg tac act gtg tgt gat gtt gcc atg aat atc atc atg tca aag agt   3389
Leu Tyr Thr Val Cys Asp Val Ala Met Asn Ile Ile Met Ser Lys Ser
1065                    1070                    1075                    1080

act aca tac agt ttg gaa tct cct aaa gac ccg gta cta cca gct cgt   3437
Thr Thr Tyr Ser Leu Glu Ser Pro Lys Asp Pro Val Leu Pro Ala Arg
            1085                    1090                    1095

ttc ttc act caa cct gac aag aat ttc agt aac acc aaa aat tat ctg   3485
Phe Phe Thr Gln Pro Asp Lys Asn Phe Ser Asn Thr Lys Asn Tyr Leu
            1100                    1105                    1110

cct cct gaa atg aaa tca ttt ttc act cct gga aaa cct aaa aca acc   3533
Pro Pro Glu Met Lys Ser Phe Phe Thr Pro Gly Lys Pro Lys Thr Thr
            1115                    1120                    1125

aat gtt cta gga gct gtt aac aag cca ctt tca tca gca ggc aag caa   3581
Asn Val Leu Gly Ala Val Asn Lys Pro Leu Ser Ser Ala Gly Lys Gln
        1130                    1135                    1140

tct cag acc aaa tca tca cga atg gaa act gta agc aat gca agc agc   3629
Ser Gln Thr Lys Ser Ser Arg Met Glu Thr Val Ser Asn Ala Ser Ser
1145                    1150                    1155                    1160

agc tca aat cca agc tct cct gga aga ata aag ggg agg ctt gat agt   3677
Ser Ser Asn Pro Ser Ser Pro Gly Arg Ile Lys Gly Arg Leu Asp Ser
            1165                    1170                    1175

tct gaa atg gat cac agt gaa aat gaa gat tac aca atg tct tca cct   3725
Ser Glu Met Asp His Ser Glu Asn Glu Asp Tyr Thr Met Ser Ser Pro
            1180                    1185                    1190

ttg ccg ggg aaa aaa agt gac aag aga gac gac tct gat ctt gta agg   3773
Leu Pro Gly Lys Lys Ser Asp Lys Arg Asp Asp Ser Asp Leu Val Arg
            1195                    1200                    1205

tct gaa ttg gag aag cct aga ggc agg aaa aaa acg ccc gtc aca gaa   3821
Ser Glu Leu Glu Lys Pro Arg Gly Arg Lys Lys Thr Pro Val Thr Glu
        1210                    1215                    1220
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24

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cag gag gag aaa tta ggt atg gat gac ttg act aag ttg gta cag gaa    3869
Gln Glu Glu Lys Leu Gly Met Asp Asp Leu Thr Lys Leu Val Gln Glu
1225            1230            1235            1240

cag aaa cct aaa ggc agt cag cga agt cgg aaa aga ggc cat acg gct    3917
Gln Lys Pro Lys Gly Ser Gln Arg Ser Arg Lys Arg Gly His Thr Ala
            1245            1250            1255

tca gaa tct gat gaa cag cag tgg cct gag gaa aag agg ctc aaa gaa    3965
Ser Glu Ser Asp Glu Gln Gln Trp Pro Glu Glu Lys Arg Leu Lys Glu
            1260            1265            1270

gat ata tta gaa aat gaa gat gaa cag aat agt ccg cca aaa aag ggt    4013
Asp Ile Leu Glu Asn Glu Asp Glu Gln Asn Ser Pro Pro Lys Lys Gly
        1275            1280            1285

aaa aga ggc cga cca cca aaa cct ctt ggt gga ggt aca cca aaa gaa    4061
Lys Arg Gly Arg Pro Pro Lys Pro Leu Gly Gly Gly Thr Pro Lys Glu
        1290            1295            1300

gag cca aca atg aaa act tct aaa aaa gga agc aaa aaa aaa tct gga    4109
Glu Pro Thr Met Lys Thr Ser Lys Lys Gly Ser Lys Lys Lys Ser Gly
1305            1310            1315            1320

cct cca gca cca gag gag gag gaa gaa gaa gaa aga caa agt gga aat    4157
Pro Pro Ala Pro Glu Glu Glu Glu Glu Glu Glu Arg Gln Ser Gly Asn
            1325            1330            1335

acg gaa cag aag tcc aaa agc aaa cag cac cga gtg tca agg aga gca    4205
Thr Glu Gln Lys Ser Lys Ser Lys Gln His Arg Val Ser Arg Arg Ala
            1340            1345            1350

cag cag aga gca gaa tct cct gaa tct agt gca att gaa tcc aca cag    4253
Gln Gln Arg Ala Glu Ser Pro Glu Ser Ser Ala Ile Glu Ser Thr Gln
        1355            1360            1365

tcc aca cca cag aaa gga cga gga aga cca tca aaa acg cca tca cca    4301
Ser Thr Pro Gln Lys Gly Arg Gly Arg Pro Ser Lys Thr Pro Ser Pro
    1370            1375            1380

tca caa cca aaa aaa aat gtg taagttgtaa atattacatt tcaaaccaat       4352
Ser Gln Pro Lys Lys Asn Val
1385            1390


ttcaaattat tttgcaaaag ttcctaaatt tgtaaacata catattgctg tatttaaatt  4412

ccatatattt agccccatta cactaggtac ggcggcgaag tgctaaaagg gaacggcgat  4472

gaacaaatgt aattaataac tttctctgtg aaagctttgg aaaaatcttt ttttttttt  4532

ttttttttg gtcaagcttg aggctgaata aagcctttga tgcacaaaat gggactgctg  4592

aagagtggac agttggacct tactttggtg accccataca tttgtggtca catgctttag  4652

ccatacacat ggtaacattg actatggagt cttgtgaaag tgtaatgtgc gatggctatg  4712
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25

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tagacataaa gaagaaactt gtaaatatct ttttctttt ttttaatgtt tctgatttct 4772

gaagtgcttg tatagctttt atctgcggct ttaaactgac agtacccgac tgtttattgg 4832

atctattgat ttgaaaagaa tttgttagga tagatcttaa gcagtaatct gtcagtgttt 4892

gtatttgtat tttctgcaat tttactgtga aaaaaaattt gttttcaaca attggtgtca 4952

ttttcttgat gtcactattt gttggagagt taaatggtct cttccctttg tgtatcttac 5012

ctagtgttta ctcctgggca cccttaatct tcagaggtgc taaattgtct gccattacac 5072

cagaaggatg cctctgatag gaggacaacc atgcaaattg tgaaatagtc ctgaagttct 5132

tggattactt tacacctcag tattgatttg tcccagaatt ttctggcctt tcatggcaat 5192

gaaaatttta agaagaaaga tttaaagtat tttaattta aagagtgtgt tataaaataa 5252

tgtactgaat tctttatccc attttatcat cctttcagtt tttattaatc tactgtatca 5312

ataaaattct gtaatttgaa tgagtaaaaa aaaaaaaaaa aaa                 5355
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<210> 5
<211> 18
<212> DNA
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<220>
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      sequence

<400> 5
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<210> 6
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<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: motif

<400> 6

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